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ABSTRACT

The question of whether Black children "peak" earlier than White children in auditory sequential memory (ASM) was investigated in 122 Black children and 120 White children in grades k-3 in two racially mixed schools in a large southern community. Each S was given the ASM subtest of the Illinois Test of Psycholinguistic Abilities. Results did not support a "peak" in ASM for Black children, nor did the data support a superiority of Black children over White children in the skill tested. (Author/SB)

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The Development of Auditory Sequential Memory in Young Black and White Children

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It has been reported for some time that the highest score of young black children on the Illinois Test of Psycholinguistic Ability (ITPA) has been on the Auditory Sequential Memory subtest (ASM).

Weaver (17) investigated the psycholinguistic patterns of two experimental groups (total N=43) and one control group (N=18) of preschool (under CA=5) children. Among his findings was the relative strength of the ASM test in all groups. Klaus (11) reported data on two groups of culturally disadvantaged children between the ages of 5-6 and 6-7. Even though mean IQ scores differed and overall profiles differed in terms of level, both groups showed peaks in the ASM subtest. Bateman (1) pointed out that the profiles of white and black subjects, all from low-average socioeconomic status, were "parallel" in all areas except ASM on which black children were superior and auditory-vocal-automatic on which white children were superior. Ryckman (15) found the same pattern in both his middle class and lower class samples of first grade black children.

These studies seemed to establish the occurrence of a relatively high level of auditory memory skill, as measured by the ITPA digit-span repetition test, for preschool, kindergarten, and first grade black children. Studies which did not show the same ASM level seemed to be ignored (4, 16). Kirk and Kirk (9) summarized the research by noting that young middle class black children

> show a normal profile on all psycholinguistic abilities except in auditory sequential memory. In the latter these Negro children are superior to their other abilities and also superior to the standardization population. Lower-class Negro children show deficiencies...(except)... in auditory sequential memory, in which (they) are superior to their other abilities, equal to the normative group, but still inferior to young middle-class Negro children (p. 49-52).

Hirshoren (7) tested a group of black children (N=26) and a group of white children (N=40) when they were in kindergarten and again in second grade. At kindergarten age, the black group surpassed the white on the ASM subtest, which was also the highest point in their profile. By second grade, ASM was no longer a high point in the profile of the black pupils. In fact, the performance of second grade black children was statistically significantly inferior to their earlier kindergarten performance ($p < .01$). This lower performance was interpreted as a loss of ASM skill. Also, while ASM was significantly correlated with Stanford-Binet IQ's for the white sample, it was not for the black sample. Other research (8:29) found the same lack of relationship at first, third, and fifth grades. These data also suggest the loss of relative ASM superiority with increasing age.

The discussion of these data is often in terms of a "loss" of a skill. The question arises as to whether the black children lose a skill or whether it simply fails to keep pace with existing norms. To answer this question, standard scores from Hirshoren's data were translated back to raw scores. Table 1 shows the mean raw score points for each group at each level and the average change in raw score points. Four of the 26 black children and

Table 1 About Here

one of the 40 white children either showed no change or lost raw score points between kindergarten and second grade. Thus the black children continued to improve in their digit span repetition skill, as did the white children. The problem, if there is a problem, is not one of losing a skill, but rather one of failing to develop it further or of failing to maintain its early momentum.

That the black children did not improve according to ITPA norms in ASM between kindergarten and second grade and failed to maintain their relative superiority over the white sample is granted. However, this is not the same

thing as "losing" a skill. When the standard errors for raw scores at the various ages (13:34) are considered, the practical significance of the statistical differences must be questioned. Additionally, when one considers the apparent limit on memory "chunks" (6:244ff), all of these youngsters may have done rather well. Lastly, the standard score equivalents are fairly gross and could account for some of the differences. This idea is more completely discussed by Burns (3).

The consistency of the findings, however, seemed to require further clarification and explanation. The purpose of this study was to explore the following question:

> Do black children indeed "peak" earlier in ASM than white children in Georgia? This question has to do with the generalizability of previous findings which used mid-western children for the most part.

Methodology

The design for the study was a two-way analysis of variance: two races at four grade levels. Table 2 shows the number of children in each cell.

Tables 2 & 3 About Here

The 242 subjects were children in kindergarten through third grade from two racially mixed schools in Columbus, Georgia. The children were nominated by their teachers as doing average school work for their grade.

Each child was given the Auditory Sequential Memory subtest of the ITPA (10). In order to maintain uniformity of administration across examiners, the stimuli were recorded and administered using Language Masters.

These children also represented five age levels as shown in Table 3.

Results

Analysis of variance with estimated missing scores results are summarized

in Table 4 and Table 5. Two analyses--race by grade and race by age--were done

Tables 4 & 5 About Here

for both raw scores and standard scores. Means were compared by the Newman-Keuls' Test (12).

The main effects of race and age are significant on both raw scores and standard scores. The main effect of grade is significant when raw scores are used but not when standard scores are used.

In every comparison, white children score significantly higher than black children (Tables 4 & 5).

The comparison of grade raw score means (Table 4) reveals that grades 2 and 3 do not differ, but both are superior to grades 1 and K. Grade 1 is also superior to K.

The age differences are more complex. To reduce confusion, each group is referred to by its lower limit in years. When raw score means are compared the five-year-olds score significantly lower than the seven, eight, and nine-year-olds; six-year-olds score significantly lower than eight-year-olds. When standard score means are compared, however, the only significant difference is between five- and nine-year-olds.

Discussion

The results do not support a "peak" in auditory sequential memory for black children, as reported in previous literature. Nor do the data support a superiority of black children in the skill tested. At no age or grade level did black children score significantly higher than white. Both groups improved equally in raw score as they got older. Both groups fell equally in their relative ranking on the norms (standard scores), contrary to Hirshoren's findings (7). The research reviewed in the first part of this article would

predict significant race by grade and race by age interactions when standard scores were analyzed. This did not occur. Thus, the earlier reported findings that younger blacks are superior to younger whites while older whites are superior to older blacks is not supported for the children of Columbus, Georgia. It is perhaps significant that other studies not supportive of the ASH racial differences were also done in the southeast (4,16).

The results of the analysis of age effects also point to the importance of differentiating between absolute (raw scores) and relative (standard scores) ability in any skill. The absolute (raw score) data reveal that children of neither group "lost" the skill, as did the analysis of Hirshoren's (7) raw score data reported earlier. Losing one's relative rank, as the standard scores show, is not the same as losing one's ability. The between-individual differences and the within-individual growth, the psychometric/edumetric (5) distinction and interrelationship, need to be kept in mind. One without the other is insufficient, as Newcomer and Hammill (14) state so well.

Given Burns' (3) recent discussion of the effects of restricted sampling on the norms, and the results of this study, one must question the suitability of the standard score norms for various populations. Further, the concept of a profile unique to black children must await future research.

TABLE 1

Means and Average Change for Black and White Samples (Hirshoren)

Race	K	2	Average Change
Raw Score Points			
Black	19.08	22.04	+2.96
White	17.13	23.85	+6.79
Standard Score Points			
Black	-.15	-.55	-.40
White	-.54	-.26	+.28

N=26 for black sample
40 for white sample

TABLE 2

Number of Students at Each
Grade Level by Race

Race	Grade Level				
	K	1	2	3	Total
Black	29	31	32	30	122
White	30	30	30	30	120
Total	59	61	62	60	242

TABLE 3

Number of Students at Each
Age Level by Race

	Age in Months					
Race	60-71	72-83	84-95	96-107	108-121	Total
Black	20	31	31	21	19	122
White	15	32	27	33	13	120
Total	35	63	58	54	32	242

TABLE 4

Analysis of Variance: Race and Grade

Source	df	Raw Score Mean Square	Standard Score Mean Square
Race	1	669.28**	474.40**
Grade	3	516.20**	57.04
R x G	3	57.49	44.26
Error	234	46.62	39.02

** $p < .01$

Means for the significant main effects:

	Raw Scores	Standard Scores
Black	23.25	33.86
White	26.51	36.66
Kindergarten	21.05	
1st Grade	24.03	
2nd Grade	27.17	
3rd Grade	27.05	

TABLE 5

Analysis of Variance: Race and Age

Source	df	Raw Score Mean Square	Standard Score Mean Square
Race	1	549.22**	472.88**
Age	4	250.82*	96.61*
R x A	4	82.05	74.70
Error	232	48.70	37.72

* $p < .05$

** $p < .01$

Means for the significant main effects:

	Raw Scores	Standard Scores
60-71	21.49	37.20
72-83	22.95	35.59
84-95	25.86	35.43
96-107	27.43	35.02
108-121	26.19	32.50

Black and white means given in Table 4

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